# PUTTER WITH VIBRATION ISOLATION

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a golf club, and, more particularly, to a golf putter having a vibration dampening member.

2. Description of the Related Art

Golf clubs have long been developed to improve the "touch and feel" of the club, including the clubs used on and around the green. One approach to improve the touch and feel of a club is to modify either the grip, the shaft, or the strike face of the golf club. For example, modifications to the club head could include an insert that is placed on the club strike surface to affect the impact of the club with the golf ball and to improve the feedback to the golfer after impact.

Some known golf clubs include a dampening insert. However, these known dampeners result in an inconsistent feel across the face of the golf club. The feel of the club, and the performance of the golf ball upon being struck, vary depending on what portion of the striking face contacts the golf ball.

Thus, what is needed is a golf club with a vibration dampening insert that provides consistent feel across the length of the striking face.

## SUMMARY OF THE INVENTION

The present invention relates to a golf club head having a vibration dampening member. The club head includes a face member, a dampening member, and a body member. The face member has a striking face and a rear surface opposite the striking face. The

dampening member is connected to the rear surface of the face member. The body member is connected to the dampening member opposite the face member. The body member includes a hosel for attaching a shaft to the club head. Preferably, the face member is formed of aluminum or an aluminum alloy and the body member is formed of steel.

The dampening member extends along a large percentage of the face member. This helps ensure that vibrations generated during normal use of the club are attenuated regardless of what part of the club face strikes the ball, and also provides a softer feel to the club. Preferably, the dampening member is connected to substantially all of the face member rear surface, which substantially isolates the face member from the body member. To further ensure any vibrations are attenuated and to further enhance the feel of the club, the face member is completely isolated from the body member by the dampening member. Preferably, the rear surface of the face member has a perimeter profile, and the dampening member has a perimeter profile that is substantially the same as the rear surface perimeter profile. An adhesive can be used to connect the parts, and the dampening member itself may service as an adhesive. Mechanical fasteners, either alone or in conjunction with an adhesive, can also be used.

The dampening member may preferably include one or more of rubber, urethane, polyurethane, butadiene, polybutadiene, and silicone. The dampening member may be a composite layer. Furthermore, the dampening member can be provided in a color contrasting the colors of the face member and the body member. This color difference can be a useful tool for the golfer to use when aligning the shot. The dampening member is preferably approximately 0.02 inch to approximately 1 inch thick, and more preferably approximately

0.03 inch to approximately 0.08 inch thick. The face member is preferably approximately 0.05 inch to approximately 0.25 inch thick, and more preferably approximately 0.1 inch to approximately 0.2 inch.

The club head of the present invention can be assembled using a mold containing two mold plates. The face member is placed in a cavity within one plate of the mold and the body member is placed in a cavity of a corresponding plate of the mold. The body member is placed within one of the mold cavities. An adhesive may optionally be placed between the club head parts. The mold plates are then compressed together under force, compressing the dampening member 20 to desired thickness and dimensions. The surfaces of the parts may be roughened to facilitate bonding, and the mold may optionally be heated during the molding process.

## DESCRIPTION OF THE DRAWINGS

The present invention is described with reference to the accompanying drawings, in which like reference characters reference like elements, and wherein:

Figure 1 shows a golf club head of the present invention;

Figure 2 shows an exploded view of the golf club head of Figure 1; and

Figure 3 shows a cross-section of a preferred assembly setup for the golf club head of Figure 1.

## DETAILED DESCRIPTION OF THE INVENTION

Figure 1 shows a golf club head 1 of the present invention. The club head, which is shown as a putter head in the illustrated embodiment, includes a face member 10, a dampening member 20 illustrated as a layer of dampening material, and a body member 30.

The face member 10 has a striking face 12 and a rear surface 14 opposite the striking face 12. The dampening member 20 is coupled to the rear surface 14. The body member 30 is coupled to the dampening member 20 on a surface opposite the face member 10, and includes a hosel 32 for connecting the club head 1 to a shaft.

Figure 2 shows an exploded view of the golf club head 1. The dampening member extends along a large percentage of the face member 10. This helps ensure that vibrations generated during normal use of the club are attenuated regardless of what part of the club face strikes the ball. This also provides a softer feel to the face member 10. Preferably, the dampening member 20 is coupled to substantially all of the rear surface 14, substantially isolating the face member 10 from the body member 30. There may be some portion of the face member 10, such as at the hosel 32, that contacts the body member 30. This may allow some vibrations to be transmitted around the dampening member 20. Some amount of the vibrations may also be transmitted through any mechanical fasteners that couple the face member 10, dampening member 20, and body member 30.

The surfaces around the hosel 32 can be dealt with in a variety of manners. One option, as mentioned above, is to simply allow the face member 10 and the body member 30 to be in contact. Another option is to leave a gap between the face member 10 and the body member 30 around the hosel 32. A third option is to provide a dampening material between the face member 10 and the body member 30. This dampening material may be the same as the dampening member 20 or it may be independent from the dampening member 20.

To further ensure any vibrations are attenuated and to further enhance the feel of the club, the face member 10 is completely isolated from the body member 30 by the dampening

member 20. Preferably, the rear surface 14 has a perimeter profile, and the dampening member 20 has a perimeter profile that is substantially the same as the rear surface perimeter profile. An adhesive can be used to couple the parts together. Figure 3 shows a cross-section of a preferred assembly setup for the golf club head 1. An upper mold part 40 and a lower mold part 41 are provided, and the face member 10, dampening member 20, and body member 30 are positioned in mold cavities. Adhesive may be placed between the club parts. The mold plates 40, 41 are compressed together under force, compressing the dampening member 20 to desired thickness and dimensions. The surfaces of the parts may be roughened to facilitate bonding. Since the dampening material 20 is much softer than either the face member 10 or the body member 30, it takes on effectively all of the compressive force. The mold may optionally be heated during the molding process. The dampening material may preferably be chosen such that no additional adhesive is required. Any excess material is trimmed off after removing the club head 1 from the mold.

Preferred dampening materials include one or more of rubber, urethane, polyurethane, butadiene, polybutadiene, and silicone. The dampening member 20 may be a composite layer. For example, different materials can be provided in the toe, center, and heel portions of the dampening member 20. Furthermore, the dampening member 20 can be provided in a color contrasting the colors of the face member 10 and the body member 30. This color difference can be a useful tool for the golfer to use when aligning the shot. The dampening member 20 is preferably approximately 0.02 inch to approximately 1 inch thick, and more preferably approximately 0.03 inch to approximately 0.08 inch thick, where thickness is measured in a direction substantially perpendicular to the longitudinal axis of the club head 1.

Aluminum is a preferred material for the face member 10. Aluminum is relatively soft, enhancing the feel of the club head 1. Steel is a preferred material for the body member 30. The face member 10 is preferably approximately 0.05 inch to approximately 0.25 inch thick, and more preferably approximately 0.1 inch to approximately 0.2 inch thick.

Steel is relatively heavy, providing a solid feel to the club head 1. The body member 30 can designed to increase the club head moment of inertia about a vertical axis passing through the club head center of gravity. This could be done, for example, by placing weights in the heel and toe portions of the body member 30.

While the preferred embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not of limitation. It will be apparent to persons skilled in the relevant art that various changes in form and detail can be made therein without departing from the spirit and scope of the invention. For example, while the invention has been described above in terms of a golf putter, the disclosed ideas and concepts could also be applied to other types of golf clubs, including iron-type clubs, wood-type clubs, and hybrid clubs. Thus the present invention should not be limited by the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.